Natural Development Server on Mainframes

This document describes the concept and the architecture of the Natural Development Server (Product code NDV) which is designed for use under SMARTS on VSE/ESA .

In addition, an optional Natural Development Server CICS Adapter is available that enables Natural Development Servers for OS/390 or SMARTS/VSE to be used with a CICS TP monitor.

The following topics are covered:

- Development Server Concept
- Front-End Stub NATRDEVS
- Transaction Processors
- Front-End
- Gateway Module
- Server Monitor
- Product Interaction

Development Server Concept

A Natural Development Server is a multi-user, multi-tasking application. It can host Natural sessions for multiple users and execute their requests concurrently.

The concept is based on the "serverized" Natural runtime system. Its architecture comprises a server front-end stub (development server stub NATRDEVS) that uses the Natural front-end to dispatch Natural sessions and to execute functionality within these sessions.

The Natural remote development server architecture basically consists of:

- Front-end stub
  The stub NATRDEVS is launched to initialize a Natural Development Server, listens for incoming transactions and dispatches the appropriate Natural session for executing the transaction.
- Front-end
  The front-end is called (together with the Natural runtime) by the front-end stub for session initialization/termination, request execution and session rollin/rollout.
- Gateway module
  The module NATGWSTG provides for interaction between the Natural runtime and the front-end stub. NATGWSTG is linked to the Natural nucleus and is called by the Natural runtime to exchange the necessary request data.
- Transaction processors
  Transaction processors are called by the front-end stub. The application logic of each individual transaction is implemented within a transaction processor.
- Server monitor
  A monitor task allows the administrator to control the server activities, to cancel particular user sessions or to terminate the entire server, etc.

Front-End Stub NATRDEVS

The multi-user, multi-tasking, front-end stub NATRDEVS is launched to initialize a Natural Development Server.

- Stub Description
- Natural System Variables Used
- Natural I/O Handling

Copyright Software AG 2003

Stub Description

The task executing the server initialization (TMain) basically is the main listener which waits for incoming requests from the Remote Development Client. It owns a session directory to manage the multiple clients and their corresponding Natural sessions. TMain has the task to accept all incoming requests and to dispatch them to other subtasks (TWork). The process is as follows:

- First, a Map Environment command issued on the client side (in the Tools menu of Natural Studio) connects to TMain to establish a connection.
- Next, TMain inserts the client into its session directory, attaches a new TWork and passes the connection to TWork.
- TWork processes the request (indeed initializes a new Natural session if the client sends a CONNECT request) and replies to the client.
- After the reply, TWork listens on that connection for successive requests of that particular client. TWork remains active until the user on the client side (Natural Studio) switches the focus to a different environment (the local or a different mapped environment).
- If the user activates the environment again, TMain launches a new TWork that resumes the existing Natural session from the previous TWork.

That is, each client owns one subtask TWork on the Natural Development Server and multiple Natural sessions (one for each mapped environment). The subtask remains active as long as the mapped environment on Natural Studio is the currently active environment. Each Natural session remains active until the client disconnects/unmaps the corresponding environment. Consequently, a Natural session can be executed under different subtasks if the client switches among multiple environments.

Natural System Variables Used

Within a Natural Development Server session, the following Natural system variables are used:

- *TPSYS contains ’SERVSTUB’,
- *DEVICE contains ’VIDEO’ and
- *SERVER-TYPE contains ’DEVELOP’.

Natural I/O Handling

The Natural runtime allows I/O execution in the same way as in an online environment:

- A Natural Development Server intercepts the I/O and sends the 3270 data stream to Natural Studio.
- Natural Studio internally starts a terminal emulation window and passes the 3270 stream to that window.
- After I/O execution, the I/O data is sent back to the server.
- The front-end stub invokes the front-end to continue processing after I/O.

Front-End

OS/390 Batch: The Natural front-end required for a Natural Development Server is a Natural batch driver assembled with the option LE370=YES.

SMARTS: The Natural Version 3.1 front-end required for a Natural Development Server is a Natural Com-plete driver NCFNUC that is delivered with the Natural Development Server. You must not use the NCFNUC driver delivered with Natural Version 3.1 for Mainframes.

The Natural Version 4.1 front-end required for a Natural Development Server is the Natural Com-plete driver NCFNUC that is delivered with Natural Version 4.1 for Mainframes.

 Copyright Software AG 2003

CICS: The Natural front-end required for executing the Natural sessions under control of CICS is the Natural remote front-end NATCSRFE that is delivered with the Natural Development Server. For more information, refer to the Natural Development Server CICS Adapter documentation.

Transaction Processors

The transaction processors are Natural programs in the library SYSLIB that process transactions (e.g. "save source", "get library list",) requested by the Natural Development Server client. The transaction processors are invoked by the front-end stub.

Gateway Module

The gateway module NATGWSTG must be linked to the Natural nucleus.

For CICS support, the Natural Development Server distribution tape contains a remote gateway module NATRGNVD. This module is responsible for transmitting the NDV-relevant data between a Natural Development Server and the Natural session running in CICS.

For more information, refer to the Natural Development Server CICS Adapter documentation.

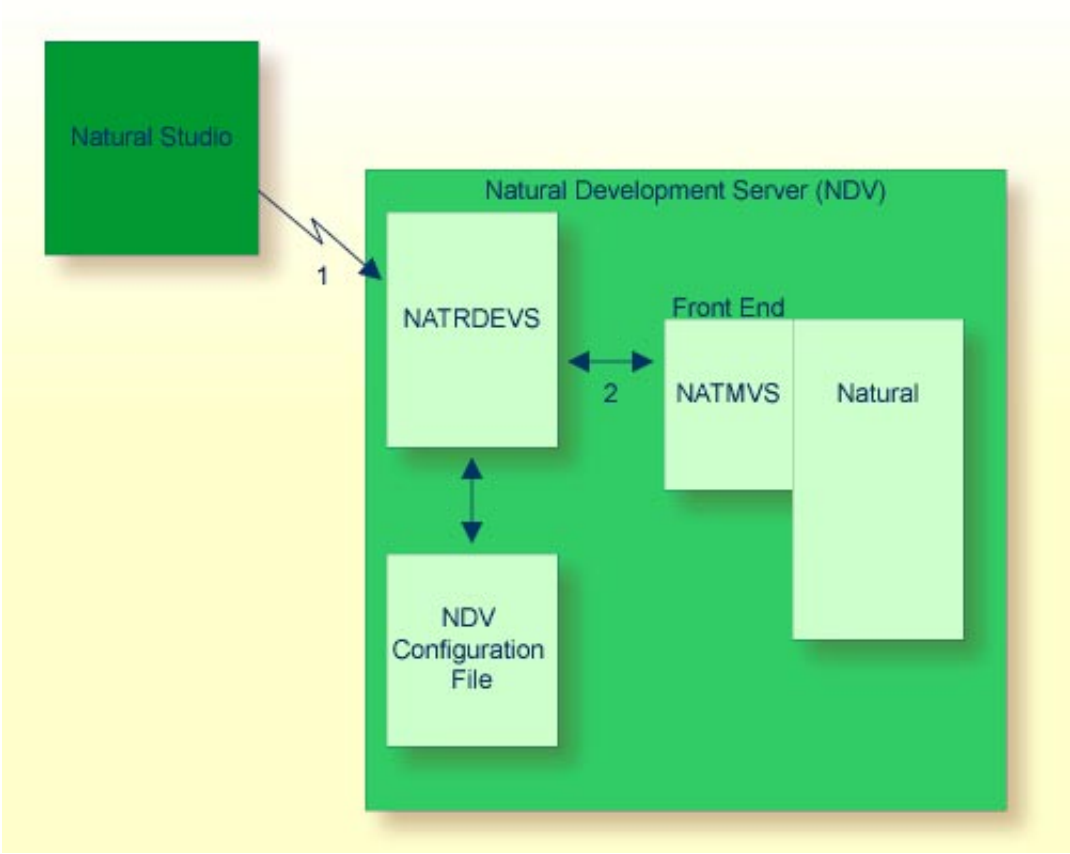
Server Monitor

To enable the administrator to monitor the status of the Natural Development Server, a monitor task is provided which is initialized automatically at server startup. Using the monitor commands, the administrator can control the server activities, cancel particular user sessions, terminate the entire server, etc. See Operating the Development Server.

Product Interaction

The following figure illustrates the interaction of Natural Studio used as a remote development client with a Natural Development Server.

Copyright Software AG 2003



1. Natural Studio sends a remote development request to the Natural Development Server (NDV) using the port number specified with the NDV configuration variable PORT_NUMBER.
2. Natural Development Server dispatches the Natural session using the Natural front-end you have specified with the NDV configuration variable FRONTEND_NAME (NATMVS in this example).

 Copyright Software AG 2003